

Claims

What is claimed is:

1. Apparatus for transferring packet data comprising:
 a first packet server;
 5 a second packet server having a point-to-point communication path established with the first packet server; and
 a third packet server configured for establishing a point-to-point communication path with the second packet server in response to receipt of a hand-off notification, the third packet server transmitting a message signal to the second packet server,
 10 the message signal including a communication path set-up request and a continue communication request.
2. The apparatus of Claim 1, wherein the second packet server is configured for transmitting a message signal to the first packet server, the message signal including
 15 notification that the communication path between the first packet server and the second packet server is to be disconnected.
3. The apparatus of Claim 1, wherein the message signal contains at least a portion of information associated with the point-to-point communication path between the
 20 first packet server and the second packet server.
4. The apparatus of Claim 1, wherein the second packet server is configured for transmitting a message signal to the third packet server, the message signal including a
 25 reply to the communication path set-up request and the continue communication request transmitted by the third packet server.

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5. The apparatus of Claim 4, wherein the third packet server is configured for transmitting a message signal to the second packet server, the message signal including a reply to the reply message signal transmitted by the second packet server.

6. The apparatus of Claim 1, wherein the point-to-point communication path between the servers is established according to a tunneling protocol.

7. Apparatus for transferring packet data comprising:
a first packet server;
a second packet server having a point-to-point communication path established with the first packet server;
a third packet server; and
the second packet server configured for establishing a point-to-point communication path with the third packet server in response to receipt of a hand-off notification, the second packet server transmitting a message signal to the third packet server, the message signal including a communication path set-up request and a continue communication request.

8. The apparatus of Claim 7, wherein the second packet server is configured for transmitting a message signal to the first packet server, the message signal including notification that the communication path between the first packet server and the second packet server is to be disconnected..

9. The apparatus of Claim 7, wherein the message signal contains at least a portion of information associated with the point-to-point communication path between the first packet server and the second packet server.

5 10. The apparatus of Claim 7, wherein the third packet server is configured for transmitting a message signal to the second packet server, the message signal including a reply to the communication path set-up request and the continue communication request transmitted by the second packet server.

10 11. The apparatus of Claim 10, wherein the second packet server is configured for transmitting a message signal to the third packet server, the message signal including a reply to the reply message signal transmitted by the third packet server.

15 12. The apparatus of Claim 7, wherein the point-to-point communication path between the servers is established according to a tunneling protocol.

20 13. Apparatus for transferring packet data comprising:
 a first packet server;
 a second packet server having a point-to-point communication path
 established with the first packet server;
 a third packet server; and
 the second packet server configured for establishing a point-to-point
 communication path with the third packet server in response to receipt of a hand-off
 notification, the second packet server transmitting a message signal to the third packet server,
 25 the message signal including a continue communication request.

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14. The apparatus of Claim 13, wherein the second packet server is configured for transmitting a message signal to the first packet server, the message signal including notification that the communication path between the first packet server and the second packet server is to be disconnected.

15. The apparatus of Claim 13, wherein the message signal contains at least a portion of information associated with the point-to-point communication path between the first packet server and the second packet server.

16. The apparatus of Claim 13, wherein the third packet server is configured for transmitting a message signal to the second packet server, the message signal including a reply to the continue communication request transmitted by the second packet server.

17. The apparatus of Claim 16, wherein the second packet server is configured for transmitting a message signal to the third packet server, the message signal including a reply to the reply message signal transmitted by the third packet server.

18. The apparatus of Claim 13, wherein the point-to-point communication path between the servers is established according to a tunneling protocol.

19. Apparatus for transferring packet data comprising:
a first packet server;
a second packet server having a point-to-point communication path established with the first packet server, the second packet server having a radius server associated therewith;

a third packet server configured for establishing a point-to-point communication path with the second packet server in response to receipt of a hand-off notification, the third packet server having a radius server associated therewith for transmitting a message signal to the radius server of the second packet server, the message signal including a continue communication request.

20. The apparatus of Claim 19, wherein the message signal further includes a communication path set-up request.

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21. Apparatus for transferring packet data comprising:

a first packet server;

a second packet server having a point-to-point communication path established with the first packet server, the second packet server having a radius server associated therewith;

a third packet server having a radius server associated therewith; and

the second packet server configured for establishing a point-to-point communication path with the third packet server in response to receipt of a hand-off notification, the radius server associated with the second packet server transmitting a message signal to the radius server of the third packet server, the message signal including a continue communication request.

22. The apparatus of Claim 21, wherein the message signal further includes a communication path set-up request.

23. A method for transferring packet data comprising the steps of:
establishing a point-to-point communication path between a first packet server
and a second packet server;

receiving a hand-off notification signal;

5 transmitting a message signal between a third packet server and the second
packet server in response to the hand-off notification signal, the message signal including a
communication path set-up request and a continue communication request.

24. The method of Claim 23, wherein the message signal is initiated by the
10 second packet server.

25. The method of Claim 23, wherein the message signal is initiated by the
third packet server.

26. A method for transferring packet data comprising the steps of:
establishing a point-to-point communication path between a first packet server
and a second packet server;

receiving a hand-off notification signal;

15 transmitting a message signal between a radius server associated with a third
packet server and a radius server associated with the second packet server in response to the
hand-off notification signal, the message signal including a communication path set-up
request and a continue communication request.

27. The method of Claim 26, wherein the message signal is initiated by the
25 radius server of the second packet server.

28. The method of Claim 26, wherein the message signal is initiated by the radius server of the third packet server.

29. A method for transferring packet data comprising the steps of:
 5 establishing a point-to-point communication path between a first packet server and a second packet server;
 receiving a hand-off notification signal;
 transmitting a message signal from the second packet server to a third packet server in response to the hand-off notification signal, the message signal including a
 10 communication path set-up request and a continue communication request.

30. Apparatus for transferring packet data comprising:
 a first packet server configured for establishing a point-to-point
 communication path between a user and a private network;
 15 a second packet server configured for establishing a point-to-point communication path between the user and the first packet server such that a multi-hop communication path is established between the user and the private network; and
 the first packet server monitoring state variables transmitted between the
 second packet server and the private network.

20 31. The apparatus of Claim 30, wherein a tunnel protocol is used to establish the multi-hop communication path.

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32. The apparatus of Claim 30, wherein the first packet server stores a four tuple state variable set wherein two state variables are associated with the second packet server and two state variables are associated with the private network.

5 33. A method for transferring packet data comprising the steps of:
establishing a point-to-point communication path between a user and a private network via a first packet server;

establishing a point-to-point communication path between the user and the first packet server via a second packet server such that a multi-hop communication path is
10 established between the user and the private network; and

monitoring state variables transmitted between the second packet server and the private network.

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34. The method of Claim 33, wherein a tunnel protocol is used to establish
15 the multi-hop communication path.

35. The method of Claim 33, wherein the first packet server stores a four tuple state variable set wherein two state variables are associated with the second packet server and two state variables are associated with the private network.

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